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Notes on Neotropical Hymenophyllaceae

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In preparing a treatment of the Hymenophyllaceae for the flora of the Guianas, I have found several taxonomic problems in the family that lie at least partially outside the Guianas, and so cannot be included in that Flora, as well as two new, narrowly endemic species of *Trichomanes* from the flora area that need to be published.

Hymenophyllum hirsutum and Two Species Confused with It

In his monograph of the American species of *Hymenophyllum* sect. *Sphaerocionium* (now called sect. *Leptocionium*), Morton (1947) considered *H. hirsutum* (L.) Swartz to be a rather variable and widely distributed species present in virtually the entire neotropics. He included 17 basionymns as synonyms under this species, far more than under any other species in the monograph. Because he prepared this treatment during and just after World War II, he was unable to see types of many of these synonyms. I believe that his inclusive concept of *H. hirsutum* also arose from his study of Jamaican material (where the type came from), which is variable in lamina size and shape. Morton did indicate (1947, p. 143, 158) the possibility of recognizing additional species from Brazil, especially the robust plants of southeastern Brazil that he placed in *H. hirsutum*.

Hymenophyllum kaieteurum, an essentially unknown species from western Guyana masquerading as *H. hirsutum*, and *H. vestitum*, a species of southeastern Brazil, are distinct species that can readily be separated from *H. hirsutum*. They differ from *H. hirsutum* and from each other on characters of lamina indument and division, segment width, and to some extent on frond size and involucre shape, as can be seen in the following key:

1. Lamina segments 0.75–1 mm wide, the marginal hairs basally forked with both arms simple; pinnae with only the basal acroscropic segments furcate. Fronds 2–6 (-10) cm long; segments slightly undulate; involucres ovate, longer than wide, not much wider than the segments .....2. *H. kaieteurum*
1. Lamina segments 1–1.5 mm wide, the marginal hairs more complex (stellate or basally forked with 1 or both branches forked or stellate); pinnae with at least the acroscopic and basiscopic basal segments furcate 2
   2. Marginal lamina hairs basally forked with 1 arm forked and 1 arm simple; segments usually plane. Fronds 2–8 (-15) cm long; segments 1–1.1 (-1.25) mm wide; involucres subcircular, a little wider than long, not much wider than the segments .....1. *H. hirsutum*
   2. Marginal lamina hairs stellate or bistellate; segments slightly undulate or folded. Fronds (5-)6–18(-30) cm long; segments 1–1.5 mm wide;

involcures subcircular, a little wider than long, as wide as the segments .....3. *H. vestitum*

1. **Hymenophyllum hirsutum** (L.) Swartz, J. Bot (Schrader) 1800(2):99. 1801.—*Trichomanes hirsutum* L. Sp. Pl. 2:1098. 1753.—TYPE: Based on plate 50B of Plumier's "Traité . . .", which is based on a specimen collected by Plumier in the West Indies.

Trichomanes ciliatum Swartz, Prodr. 136. 1788.—*Hymenophyllum ciliatum* (Swartz) Swartz, J. Bot. (Schrader) 1800(2):100. 1801.—*Sphaerocionium ciliatum* K. Presl, Hymenophyllaceae 34. 1844.—TYPE: Jamaica, *Swartz* (S not seen photo 6185, isotypes B-Hb. Willd. 20222 not seen Tryon photo, BM not seen Morton photo 6587, US).

Sphaerocionium grevilleanum K. Presl, Hymenophyllaceae 34. 1844.—*Hymenophyllum remotum* v. d. Bosch, Ned. Kruidk. Arch. 4:413. 1848, nom. superfl.—TYPE: Based on *Hymenophyllum ciliatum* sensu Hook. & Grev. (Icon. Fil. l:t. 35. 1827), which is based on a specimen collected on St. Vincent by Guilding (K not seen).

Hymenophyllum ciliatum var. *ornifolium* Kunze, Linnaea 21:240. 1848.—TYPE: Surinam, *Weigelt 164* (LZ destroyed).

Hymenophyllum surinamense v. d. Bosch, Ned. Kruidk. Arch. 4:414. 1859, nom. superfl.—TYPE: Based ultimately on *Trichomanes ciliatum* Swartz, and so based on the type of that name.

Hymenophyllum elegantissimum Fée, Hist. Foug. Antill. [Mém. Foug. 11]:118, t. 29, f. 2. 1866.—TYPE: Guadeloupe, *L'Herminier* in 1861 (P or RB not seen).

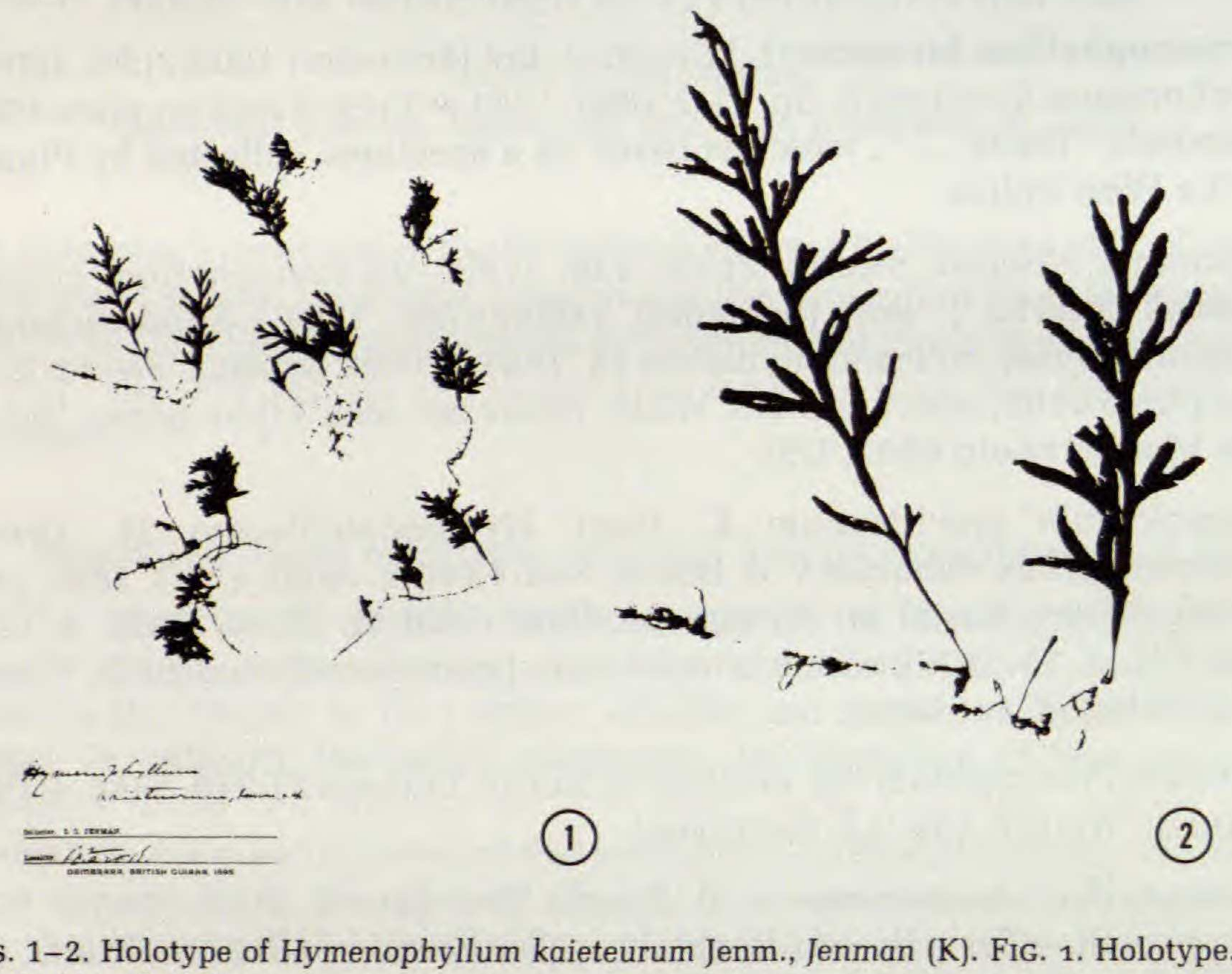
Hymenophyllum atrovirens Fée & L'Herminier in Fée, Hist. Foug. Antill. [Mém. Foug. 11]:120, t. 30, f. 4. 1866, non Colenso, 1844, nec Christ, 1904, nom. illeg.—TYPE: Pitou Caraibe, Guadeloupe, *Germain* in 1864 (P or RB not seen).

Hymenophyllum dimorphum Christ, Bull. Herb. Boissier II, 4:941. 1904.—TYPE: Alto de Mano Tigre, basin of the Río Diquis, Pcia. Puntarenas, Costa Rica, 700 m, *Pittier 12109* (P? not seen, isotype US).

DISTRIBUTION: Common in the Antilles, Mexico to Panama, Colombia to Bolivia, and Venezuela to French Guiana. Rare in northern and central Brazil (Acre, Amazonas, Pará, Minas Gerais).

2. **Hymenophyllum kaieteurum** Jenm. Ferns Brit. W. Ind. Guianas 15. 1898.—TYPE: Guyana, Potaro River, *Jenman* (K).—Figs. 1, 2.

Rhizome wide-creeping, ca. 0.25 mm in diam., the fronds distant. Fronds determinate; stipes 0.8–2.2 cm long, ca. 0.2 mm in diam., black, from the apex to the middle alate, the ala abruptly contracted, sparsely pilose on the margins, the hairs pluricellular, furcate at the base or simple; laminae ovate-lanceate, (2-)3–6 cm long, (1.5-)2–3.5 cm wide, 2 pinnate proximally (3-pinnate at the acroscopic base of the pinnae), pinnate distally; rachises uniformly alate; pinnae and pinnules alternate, the pinnae (2-)4–8 pairs, the segments slightly revolute, 0.75–1.25 (-1.5) mm wide, not emarginate; margins pilose, the hairs furcate or



FIGS. 1–2. Holotype of *Hymenophyllum kaieteurum* Jenm., *Jenman* (K). FIG. 1. Holotype. FIG. 2. Detail of two fronds.

simple, acicular, unicellular; indusial valves ovate or broadly ovate, obtuse or truncate at the base, pilose at the apex, the hairs 1- or 2-celled, the receptacles not exserted.

DISTRIBUTION: Rare endemic at ca. 400 m elevation in the uplands of western Guyana.

SPECIMENS EXAMINED: GUYANA, Potaro River, Sheenabowa [Chenapowu], *Jenman 1356* (P), *1357* (K); Mazaruni River, under 250[0]–3000 ft, *McConnell & Quelch 596* (K); Mount Raywa, *Jenman* (NY).

3. **Hymenophyllum vestitum** (K. Presl) v. d. Bosch, Ned. Kruidk. Arch. 5(3):193. 1863.—*Sphaerocionium vestitum* K. Presl, Hymenophyllaceae 58. 1844.—Lectotype: Rio de Janeiro, Est. Rio de Janeiro, Brazil, *Beyrich* (PRC? not seen), inferentially chosen by Morton (Contr. U.S. Natl. Herb. 29:155. 1947) and confirmed here.

Hymenophyllum gardnerianum Sturm in Martius, Fl. Bras. 1(2):297. 1859.—TYPE: Rio de Janeiro, Est. Rio de Janeiro, Brazil, *Gardner 213* (holotype BR not seen, isotypes K, P not seen Morton photo 4563).

Hymenophyllum caulopteron Fée, Crypt. Vasc. Brésil 1:197, t. 70, f. 3. 1869.—SYNTYPES; Serra de Estrella, Est. Rio de Janeiro, Brazil, *Glaziou 1713* (P not seen Morton photo 4561) and *920* (P not seen Morton photo

4560, isosyntype NY not seen); and Rio de Janeiro, Est. Rio de Janeiro, Brazil, *Glaziou 2269* and *2270* (both P neither seen Morton photo 4559).

Hymenophyllum microcarpon Fée, Crypt. Vasc. Brésil 1:245, t. 69, f. 3. 1869, non *H. microcarpum* Desv., nom. illeg.—SYNTYPES: Rio de Janeiro, Est. Rio de Janeiro, Brazil, *Glaziou 2268* (P not seen Morton photo 4558) and *3356* (P not seen).

Hymenophyllum ulei Christ & Giesenh. Flora 86:85, f. 6, 7. 1899.—TYPE: Teresopolis, Serra dos Orgãos, Est. Rio de Janeiro, Brazil, 1000 m. *Ule 4510* (presumably P not seen, isotypes L not seen Morton photo 2528, US).

Hymenophyllum elatius Christ in Schwacke, Pl. Nov. Mineir. 2:13. 1900.—TYPE: São Antonio, Est. Sta. Catarina, Brazil, *Ule 206* (P).

Hymenophyllum ciliatum var. *tuberosum* Rosenst. Hedwigia 46:74. 1906, as "*tuberosa*."—TYPE: A renaming of *H. ulei* Christ & Giesenh., and so based on the type of that name.

Hymenophyllum ciliatum var. *abbreviatum* Rosenst. Hedwigia 56:360. 1915, as "*abbreviata*."—TYPE: Ribiera, Est. S. Paulo, Brazil, *A. C. Brade 5169* (S not seen).

DISTRIBUTION: Occasional endemic in southeastern Brazil (Rio de Janeiro, São Paulo, Paraná).

An equally early name cited by Morton (1947, p. 155) as a synonym for this species is *Hymenophyllum commutatum* (K. Presl) v. d. Bosch, Ned. Kruid. Arch. 4:413. 1859, based on *Sphaerocionium commutatum* K. Presl., Hymenophyllaceae 34. 1844. This is based on *H. boryanum* sensu Raddi, and so on plate 79, fig. 4 of Raddi's "Plantarum Brasiliensium . . ." This figure is lacking in detail and appears to be somewhat stylized. Morton thought it too poor for positive identification. However, on the basis of lamina division and orientation of the segments it seems to me to be less like *H. vestitum* than it is like *H. glaziovii* Baker in Hook. Icon. Pl. 17, t. 1612. 1886. If this proves to be true, the name *H. glaziovii* must be replaced with the earlier name *H. commutatum*.

SELECTED SPECIMENS EXAMINED (ALL FROM BRAZIL): **Rio de Janeiro:** Near Rio de Janeiro, *Wilkes Exped. s. n.* (US). **São Paulo:** Alto da Serra, Biological Station woods, *Burkart 17453, 17465* (both US); Serra da Bocaina, *Segadas-Vianna 2746, 2832* (both US); Serra do Itatiaia, 800 m, *A. C. Brade 8826* (US), 1000 m, *Dusén 713* (US). **Paraná:** Mun. Cerro Azul, Morro Grande, *Hatschbach 7109* (US); Mun. Morretes, Pilão de Pedra, *Kummrow 1703, 1931* (both US); Mun. Quatro Barras, Morro Anhangava, *Kummrow 2476* (US).

THE IDENTITY OF HYMENOPHYLLUM NIGRESCENS

Hymenophyllum nigrescens Liebm. usually has been thought to be a fairly common independent species with a rather wide range (Mexico to Venezuela and perhaps Colombia to Bolivia and Brazil). Recently, Mickel and Beitel (1989, p. 216) considered it to be a synonym of *H. myriocarpum* Hook., a species known from Mexico to Venezuela and Colombia to Bolivia, and Tryon and Stolze (1989, p. 63) placed it as a variety of *H. myriocarpum*. On the other hand,

Smith (1985, p. 127) thought it to be a synonym of *H. axillare* Swartz, a species known only from Cuba, Hispaniola, and Jamaica.

I believe that *H. nigrescens* is a juvenile state of *H. myriocarpum*, for the plants are always small, the pinnae congested, and the fronds rarely fertile. In addition, the ranges of these two species overlap and juveniles of the *H. nigrescens* type are fairly common from Mexico to Venezuela.

Although *H. axillare* is very close to *H. myriocarpum*, I prefer to maintain the two as separate species until evidence indicates with more certainty that they are indeed one. *Hymenonphyllum myriocarpum* does not overlap with *H. axillare*, and I know of only one *H. nigrescens*-type juvenile specimen from the West Indies (*Maxon & Killip 1107*, US). The only differences I have found are involucres mostly longer than wide, rachis alae relatively narrow, and fronds narrowly rhombic and subdeterminate in *H. axillare*, versus involucres mostly wider than long, rachis alae wider (about 2 times as wide as the rachis), and fronds mostly lanceolate and determinate in *H. myriocarpum*.

The Lectotype of Hymenophyllum trichomanoides

As is typical of van den Bosch's new taxa, *H. trichomanoides* v. d. Bosch (Ned. Kruidk. Arch. 5(3):158. 1863) was described from several syntypes, including specimens of Cuming from Ecuador, Moritz from "Colombia" [i.e., Venezuela], Schomburgk from Venezuela and Guyana, and Spruce from Peru. Only the Spruce collection is precisely localized and widely distributed, and so it is best chosen lectotype: Monte Pampana near Tarapoto, Depto. S. Martín, Peru, Aug 1856, *Spruce 4696* (K not seen; isolectotypes GH, NY, L none seen, P not seen Morton photo 4620, US). Although I have not seen the lectotype, I presume it is present at Kew, which houses the main set of Richard Spruce's South American collections.

Both *H. trichomanoides* and *H. decurrens* (Jacq.) Swartz have been thought to be related to *H. polyanthos* (Swartz) Swartz. *Hymenophyllum decurrens* itself was even considered by Farwell to be a variety of *H. polyanthos*, as var. *protrusum* (Hook.) Farw. I believe the former two species are more closely related to each other than either one is to *H. polyanthos*, for segments of the latter species are often somewhat folded or undulate and have involucres that are truncate to obtuse at the base, often wider than long, and mostly ca. 1.25 mm wide. Segments of the former two species, on the other hand, are plane and have involucres that are obtuse or roundish at the base, longer than wide, and 0.75–1 mm wide.

Hymenophyllum polyanthos is known from throughout tropical America, whereas *H. decurrens* and *H. trichomanoides* have more restricted ranges. *Hymenophyllum decurrens* is principally known from the Chocó of Colombia to the Guianas and adjacent northern Brazil, with a few collections from the Cordillera Central of Costa Rica (*Croat 36439*, *Molina R. et al. 17242*, and *Valerio 214*, all US) and the mountains of Peru (*Bues 804*, *817*, both US). These outlying populations may indicate a wider range for the species than was previously thought. *Hymenophyllum trichomanoides* occurs from Colombia to Bolivia and

Guyana, with a few collections from the Cordillera Central of Costa Rica (*Lellinger 1698*, *Maxon 529*, *Molina et al. 17296, 17821*, all US).

Trichomanes ekmanii and T. kapplerianum

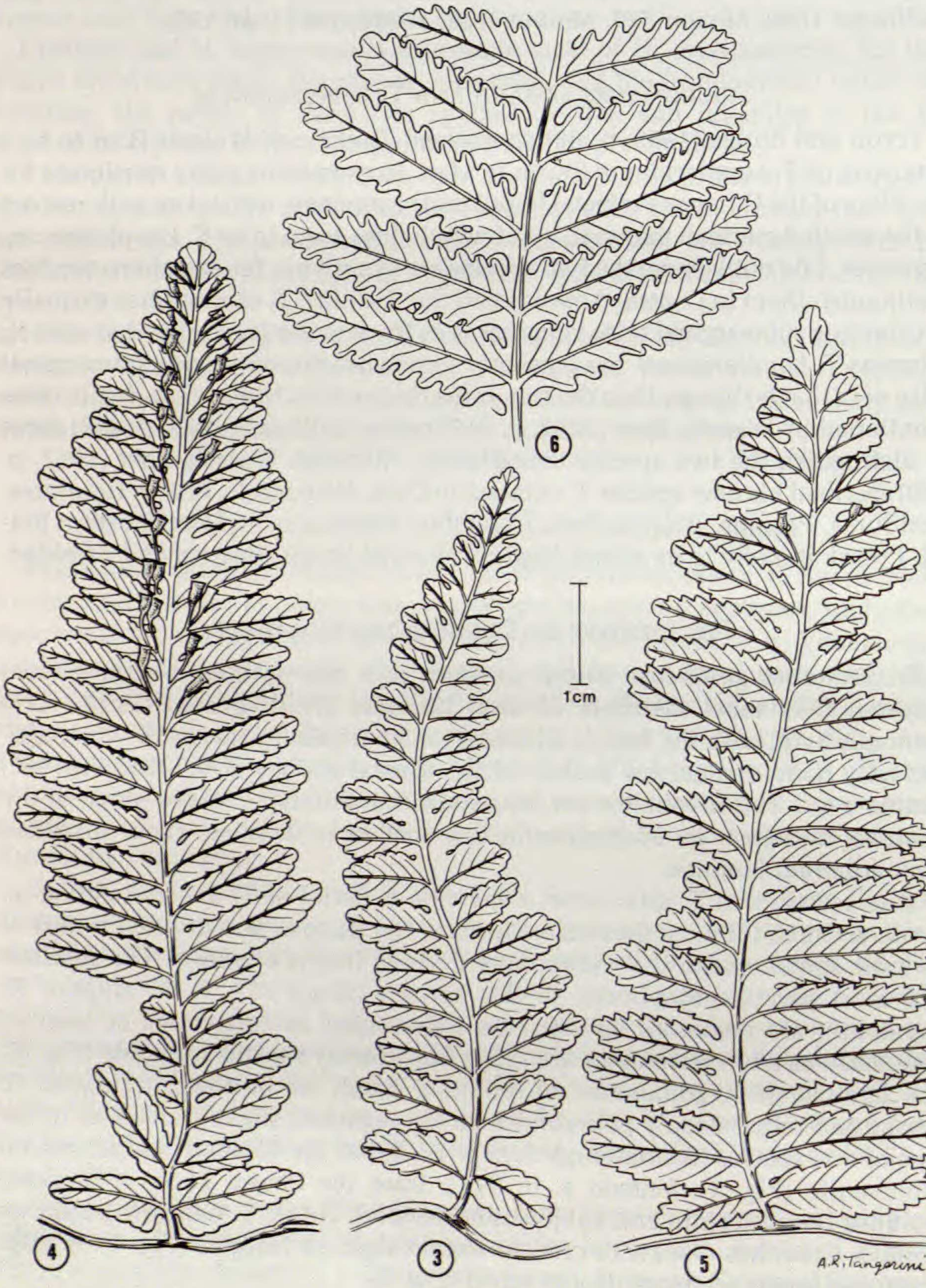
Tryon and Stolze (1989, p. 88) considered *T. ekmanii* Wessels Boer to be a synonym of *T. kapplerianum* Sturm in Mart. In examining many specimens for the Flora of the Guianas Project, I found their comments well taken with respect to the south American material, all of which does seem to be *T. kapplerianum*. However, I do not believe the two species are synonyms, for one character does distinguish them in Central America and the Antilles: *T. ekmanii* has a usually continuous submarginal false vein that is as thick as the true veins that meet it, whereas *T. kapplerianum* has a usually somewhat discontinuous submarginal false vein that is thinner than the true veins that meet it. None of the distinctions mentioned by Wessels Boer (1962, p. 317) nor by Lellinger (1989, p. 208) serve to distinguish the two species consistently. Although Wessels Boer (1962, p. 320) ascribed his new species *T. ekmanii* to Cuba, Hispaniola, British Honduras, Honduras, Panama, Bolivia, Peru, Colombia, Venezuela, and northeastern Brazil, I think it likely to be absent from continental South America and Trinidad.

The Identity of Trichomanes guianense

Trichomanes guianense Sturm in Mart. is a rare species described from Guyana. Like most members of sect. *Lacostea* (v. d. Bosch) Christ, it is hemiepiphytic with the fronds adherent to tree trunks by means of "rhizoids" (actually hairs and narrow scales) on the abaxial surface of the rhizomes and lamina axes. The involucres are long-stalked and oblique to the plane of the laminae, doubtless an adaptation in this section to facilitate spore dispersal from adherent laminae.

It is certain that *T. guianense* is juvenile material of *T. ankersii* Parker ex Hook. & Grev., for a continuum exists from the narrow, less divided fronds of juvenile specimens to the wider, more divided fronds of adults. The smallest and most juvenile specimens of this species (*Sagot 751*, K, P; *Appun*, K) apparently are common, for they are represented in collections at least as frequently as adult specimens are. They have barely repand segments (Fig. 3). The laminae of *T. guianense*, on the other hand, are narrowly triangular to oblong and rather deeply pinnatifid with the segments slightly lobed, as in the type of this species (*Schomburgk 1215 p. p.*, B; isotype K); these specimens are subjuvenile (Fig. 4). *Jenman s. n.* (NY), from the Potaro River of Guyana, includes both juvenile and subjuvenile material. Adult *T. ankersii* Parker ex Hook. & Grev. has crenate or crenate-serrate segment margins (Fig. 5). Rarely, adult specimens are more deeply lobed (Fig. 6).

Identification of specimens in certain phases is difficult. For instance, elaborated adults of *T. ankersii* are similar to subjuveniles of *T. pedicellatum* (Fig. 6 vs. Fig. 8). The former have longer, narrower fronds with more attenuate apices, often longer segments, segments with more lobes and shallower lobes, and veins more distant.



FIGS. 3–6. Fronds or pinnae of *Trichomanes ankersii*. FIG. 3. Juvenile frond (*Appun*, Guyana, K). FIG. 4. Subjuvenile "T. guianense" frond (*Jenman*, Potaro River, Guyana, NY). FIG. 5. Typical adult frond (*A. C. Smith 2824a*, Guyana, NY). Elaborated adult pinnae (*Jenman*, Pomeroon River, Guyana, NY).

Lamina Variation in Trichomanes pedicellatum

A study of the South American species *Trichomanes pedicellatum* Desv. and allied species, also members of sect. *Lacostea*, has revealed great diversity in frond form. Juvenile specimens (Fig. 7) are merely pinnatifid with nearly entire lobes. Subjuvenile specimens (Fig. 8) have pinnae with shorter lobes and correspondingly wider, uncut median portions. Such specimens have been called *Trichomanes subsessile* Splitg. or *T. commutatum* Sturm in Mart. Typical adult specimens (Fig. 9) have broadly attached pinnae with long, narrow, simple or furcate, ascending lobes (the basal lobes are often pinnately divided). Intergradation from the most juvenile to adult forms is unbroken, and even juveniles may be fertile. Occasionally atypical adult specimens with short, somewhat undulate, and decidedly imbricate pinnae are found in Surinam and French Guiana. These strikingly condensed plants (Fig. 10) have been called *T. furcatum* v. d. Bosch. In addition, atypical adult plants with more divided, elaborated laminae (Fig. 11) are not uncommon in the Guianas and Brazil. The pinnae have the basal lobes and some suprabasal lobes pinnately divided, in addition to having typical simple and furcate lobes. The plants are robust and appear very full. These have been called *T. volubile* Vellozo, a name sometimes attributed to Antonio de Arrabida, who edited Vellozo's "Flora Fluminensis."

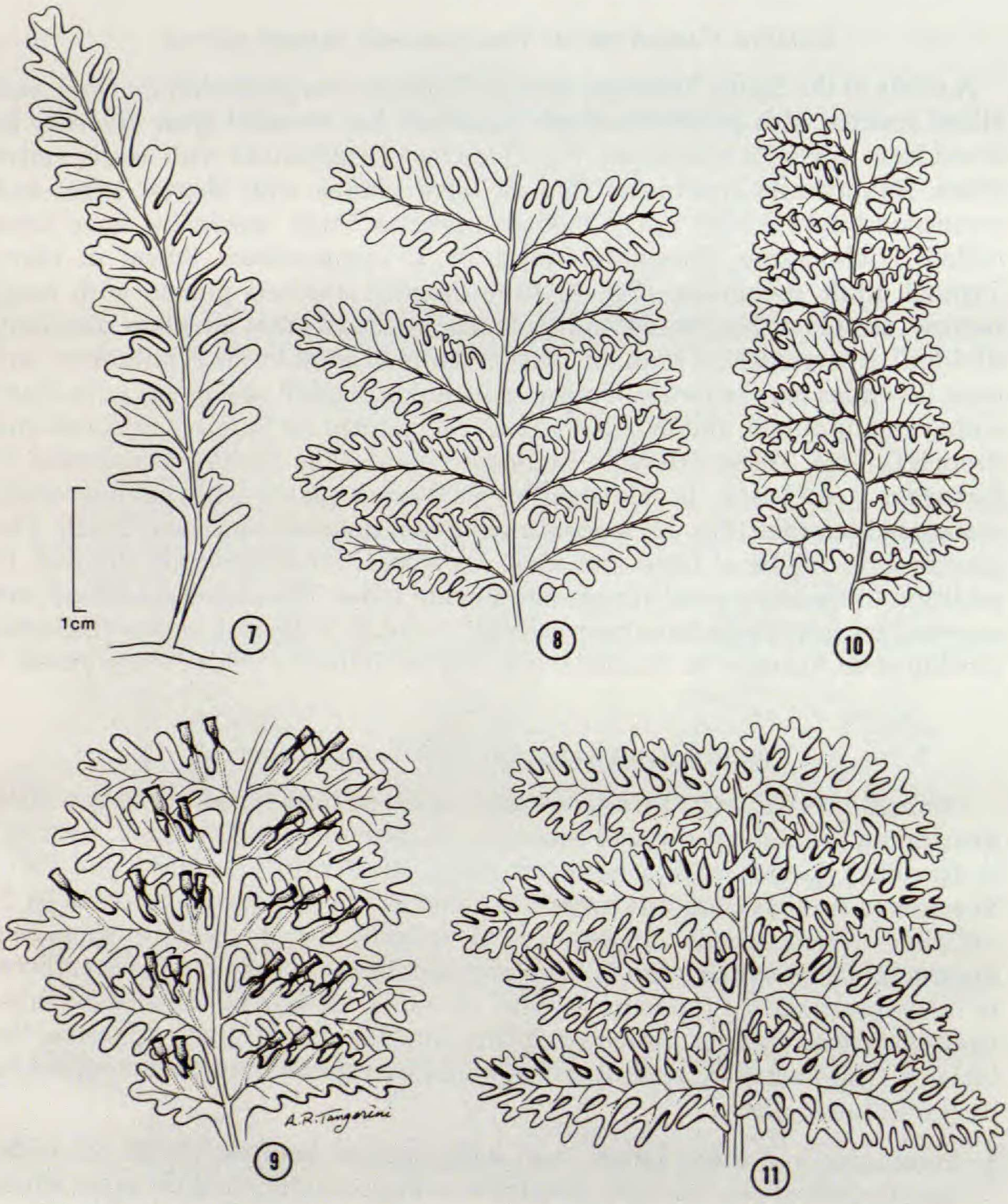
Trichomanes radicans and T. collariatum

Trichomanes radicans Swartz is based on a type from Jamaica, but is widely distributed throughout tropical America. *Trichomanes collariatum* v. d. Bosch is an allied species with a narrower range, Mexico to Venezuela and Peru. Specimens from outside this range identified as this species are likely to be *T. radicans*. *Trichomanes collariatum* is notable for its widely spreading involucral labia, which seem to form a wide collar at the apex of the involucre. In Mesoamerica, *T. radicans* is said to differ in having involucral labia rudimentary or lacking. However, in the Antilles and in South America, the labia of *T. radicans* are well developed. The two species can be distinguished by the following key:

1. Involucres 3–4 times longer than wide; mature laminae 10–20 cm wide, usually widest near the base, the pinnae acute to acuminate at the apex; stipes 3–12 cm long.....*T. radicans*

1. Involucres 2–3 times longer than wide; mature laminae mostly no more than 10 cm wide, usually widest near the middle, the pinnae mostly nearly round or nearly obtuse (acute pinnae also seen); stipes 1–6 cm long.....*T. collariatum*

Because of the difference in involucral labia, the Mesoamerican material may be known as *Trichomanes radicans* var. **mexicanum** (v. d. Bosch) Lellinger, based on *T. mexicanum* v. d. Bosch, Ned. Kruidk. Arch. 5(2):164. 1861, which is based on two syntypes from Mexico, *Schiede 806* (B not seen fragm L not seen); and *Schaffner 7* (P or RB not seen fragm L; probable isosyntype K not seen Morton photo 19052).



FIGS. 7–11. Fronds or pinnae of *Trichomanes pedicellatum*. FIG. 7. Juvenile frond (*Fanshawe F-2168*, Guyana, K). FIG. 8. Subjuvenile "T. subsessile" pinnae (*Sagot 742*, French Guiana, P). FIG. 9. Typical adult pinnae (*Leprieur 229* in Nov 1837, French Guiana, P). FIG. 10. Condensed adult "T. furcatum" pinnae (*Leprieur 229* in Dec 1830, French Guiana, P). FIG. 11. Elaborated adult "T. volubile" pinnae (*Granville et al. 6180*, French Guiana, NY).

TWO NEW SPECIES OF TRICHOMANES

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Trichomanes (Neurophyllum) jenmanii Lellinger, sp. nov.—Fig. 12.

Rhizoma erectum vel ascendens 2–3 mm diametro, basibus stipitum inclusis. Stipites ca. 0.5 mm in diam. teres brunnei vel dilute brunnei, fere and basin

FIG. 12. Holotype of *Trichomanes jenmanii*, *Jenman* (NY).

anguste alati, sparse pilosi, pilibus catenatis laxis brunneis, stipitibus sterilibus 0.5–2.5 cm longis, stipitibus fertilibus (3)4–8(10) cm longis. Frondes valde dimorphae, frondis fertilis erectis, frondibus sterilibus patentibus excedenti; laminae dimorphae pinnatae; laminis sterilibus ellipticis vel oblongis 2–6(8) cm longis 1.5–2.5 cm latis, pinnis lateralibus (4) 6–12-jugis alternatis vel oppositis, omnino acroscopice productis, lobis acutis vel saepe caudatis, pinnis terminalis triangularibus vel quadrangularibus non conformis; laminis fertilibus oblongo-triangularibus (2)3–4(7) cm longis (1)2–3(4) cm latis, pinnis lateralibus 2–4-jugis oppositis, haud acroscopice productis, lobis involucris terminantibus, pinnis terminalis elongatis conformis; involucris non immersis subcylindricis ca. 1 mm longis 0.5 mm latis, labiis rudimentariis vix divaricatis.

TYPE: GUYANA, Potaro River, Pacatout, 6 miles deep in the forest, March 1901, *Jenman* (NY: isotype NY). PARATYPES: GUYANA, Potaro River, Eagle Mt., *Jenman* (NY); GUYANA, Mazaruni River, Pimah Falls, *Jenman* (NY); GUYANA, Potaro River, March 1901, *Quelch* (NY; material atypical).

In its lack of false veins, this species resembles *T. hostmannianum* (Klotzsch) Moore. Although it is diminutive compared with *T. hostmannianum*, *T. jenmanii* clearly is not precociously fertile juvenile material of that species, for true juveniles of *T. hostmannianum* have only serrate pinnae, and not caudately lobed ones. In addition, specimens of *T. jenmanii*, insofar as I know, grow only at 100–200 m elevation and are confined to a small part of Guyana lying at the foot of the escarpment that runs through the western part of that country. If this species were juvenile *T. hostmannianum*, it likely would be found scattered throughout the rather wide range of that species, from western Colombia to French Guiana, adjacent Brazil, and also from Peru.

Trichomanes (Pachychaetum) windischianum Lellinger, sp. nov.—Fig. 13.

Rhizoma valde breviter repens usque ad 3 cm longum 1–1.25 mm latum setiferum, juventute setis brunneis catenatis translucidis. Stipites 2–4 mm distans 1–5 cm longi 0.3–0.5 mm lati omnino exalati. Frondes monomorphae, laminae anguste lanceolatae vel rhombicae 3.5–8 cm longae 1–2 cm latae 3–4(5)-pinnatae; rachidi exalata vel atata, ala angustissima 1 cellulis latis; pinnae 12–15(20) paria alternatae, pinnulis alternatis, segmentis ca. 0.75 mm latis inter venas et margines 3–5 cellulis latis; involucris lateralibus acroscopicis 1–1.5 mm longis ca. 0.8 mm latis conicis, labiis angustis leviter divaricatis.

TYPE: SURINAM, Tafelberg, Arrowhead Basin, *Maguire 24621* (NY; isotype US). PARATYPES: GUYANA, Pakaraima Mountains, Mt. Membaru, *Maas & Westra 4334* (U not seen; isoparatype NY); GUYANA; Upper Mazaruni District, east bank of the Waruma River 20 km south of the confluence with the Kako River, 1000 m, *Renz 14191* (U); GUYANA, North slope of Mt. Roraima, 700–1000 m, *Renz 14234* (U), 2000–2300 m, *Renz 14271* (U); SURINAM, Kappelsavanna near the southern foot of Tafelberg, *Kramer, Hekking & Tryon 3253* (U).

This species differs from the other species of subg. *Pachychaetum* in having short-creeping rather than ascending or strictly erect rhizomes and in having the ala of the stipe only 1 cell wide and obscure, rather than 2 or more cells wide and obvious. In addition, the laminae are narrowly lanceolate, rather than more broadly so or rhombic. *Trichomanes windischianum* is known from Guyana and Surinam at elevations of 500–600 m on cliffs and on rocks in streams.

FIG. 13. Holotype of *Trichomanes windischianum*, Maguire 24621 (NY).

Literature Cited

Lellinger, D. B. 1989. The Ferns and Fern-allies of Costa Rica, Panama, and the Chocó, Part 1. Pteridologia 2A:1–364.

Mickel, J. T. and J. M. Beitel. 1988. Pteridophyte Flora of Oaxaca, Mexico. Mem. New York Bot. Gard. 46:1–568.

Morton, C. V. 1947. The American species of Hymenophyllum section Sphaerocionium. Contr. U. S. Nat'l. Herb. 29:139–201.

Smith, A. R. 1985. Pteridophytes of Venezuela, an Annotated List. Privately printed by the author. vii + 254 pp.

Tryon, R. M. and R. G. Stolze. 1989. Ferns of Peru, Part I. Fieldiana Bot., N.S. 20:1–145.

Wessels Boer, J. G. 1964. The New World species of Trichomanes sect. Didymoglossum and Microgonium. Acta Bot. Neerl. 11:227–330.

Announcement

On June 1, 1991, Richard Hauke will take over the duties of Records Treasurer for the Fern Society from David S. Barrington, who has served since 1984. Dr. Hauke will be logging payments, maintaining the mailing list, and various related activities. Communicate with Dr. Hauke about joining the society, changing addresses, and dues payments etc. at the following address:

Richard L. Hauke
Records Treasurer, American Fern Society
456 McGill Place
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